

Two Methods of Measuring Farm-Linked Employment

The Economic Research Service uses two methods to measure economywide employment related to agriculture: farm and farm-related employment (FFR) and the food and fiber system (FFS). Both methods are widely respected, and, while they provide different employment totals, both point to the continued importance of farm-related jobs in an era when direct farm employment has declined to modest levels. Both methods also recognize the wide-ranging influence of farm-related activity in the U.S. economy beyond the farm gate.

The two methods each have strengths and weaknesses. The FFS estimates are based on a method that explicitly models the interrelationships between various sectors of the economy. The FFS estimates have a close relationship to the U.S. Department of Commerce's National Income and Product Accounts. The FFR estimates have the advantage of rich geographic detail that can provide valuable information about the importance of agriculture in various regions of the country.

Farm and Farm-Related Employment

The Census Bureau's enhanced County Business Patterns data are combined with farm employment data from the Bureau of Economic Analysis to estimate farm and farm-related employment (app. tables 4 and 5). Farm and farm-related employment includes jobs not only in farm production, but also in its closely related industries—agricultural services, forestry, and fishing; agricultural inputs; and processing and marketing of agricultural goods—as well as industries peripherally related to farming—wholesale and retail trade of agricultural products and indirect agribusiness. Farm and farm-related industries are identified as industries having 50 percent or more of their national workforce employed in providing goods and services necessary to satisfy the final demand for agricultural products. An exception to this criterion is indirect agribusiness, in which percentages range between 32 and 50 percent. *[Alex Majchrowicz, 202-694-5355, alexm@ers.usda.gov]*

Food and Fiber System

The Food and Fiber System (FFS) is the set of producers of goods and services required to assemble, process, and distribute raw farm products to U.S. and foreign consumers. FFS employment estimates (app. table 6) are developed using a national input-output model that describes input use and factor payments for each sector of the economy. The model is used to estimate the amount of employment in each sector needed to support the final demands for agricultural products. Thus, this measure includes jobs in all sectors of the economy, even those where the link to agriculture is weak. However, unlike the FFR measure, the FFS estimates do not count all jobs in a particular sector; only the jobs needed to support demand for agricultural products are counted. The FFS measure is available at the State and national levels. *[William Edmondson, 202-694-5374, wedmonds@ers.usda.gov]*

Appendix table 4—Share of total State employment by farm and farm-related industry, 1996

State	Total farm and farm-related industries	Total farm and farm-related industries	Farm production, services, forestry, and fishing	Agricultural inputs	Agricultural processing and marketing	Agricultural wholesale and retail trade	Indirect agribusiness
	Jobs	Percentage of total employment					
United States	22,732,653	15.1	2.3	0.3	2.1	10.1	0.4
Alabama	426,442	18.6	2.8	.4	4.8	10.2	.5
Alaska	58,993	16.5	4.2	.1	2.2	10.0	—
Arizona	306,809	13.2	1.2	.2	.6	11.1	.1
Arkansas	282,053	20.5	5.0	.6	5.1	9.0	.8
California	2,481,102	14.4	2.1	.2	2.0	10.0	.3
Colorado	355,115	14.3	1.8	.2	1.3	10.7	.2
Connecticut	218,945	11.0	.7	.1	.7	9.2	.3
Delaware	60,096	13.4	1.1	.2	2.4	9.4	.3
Florida	1,107,739	14.6	1.6	.2	1.0	11.6	.2
Georgia	739,493	17.1	1.7	.3	3.9	10.7	.6
Hawaii	115,601	16.0	1.9	.1	1.3	12.7	—
Idaho	143,066	21.2	6.5	1.1	3.0	10.4	.4
Illinois	935,488	13.6	1.6	.6	1.6	9.2	.5
Indiana	519,146	15.4	2.5	.3	1.4	10.6	.5
Iowa	411,527	22.9	7.3	1.6	3.9	9.7	.5
Kansas	305,497	18.9	5.3	.8	2.7	9.7	.4
Kentucky	412,498	19.9	5.6	.3	3.0	10.5	.5
Louisiana	336,026	15.1	2.3	.4	1.6	10.4	.5
Maine	117,120	16.7	2.5	.1	3.1	10.6	.4
Maryland	340,413	12.2	1.1	.1	1.0	9.9	.2
Massachusetts	472,957	12.3	.5	.1	1.3	10.0	.4
Michigan	730,341	14.1	1.7	.2	.9	11.0	.3
Minnesota	482,814	15.7	3.7	.6	1.9	9.1	.4
Mississippi	262,395	19.2	4.6	.5	4.2	9.4	.5
Missouri	537,976	16.6	4.0	.5	2.2	9.5	.4
Montana	95,607	19.3	6.2	.6	.8	11.6	.2
Nebraska	245,857	22.1	6.7	1.7	4.0	9.5	.2
Nevada	105,717	10.8	.7	.1	.4	9.6	.1
New Hampshire	95,340	13.5	.9	.1	1.2	11.0	.4
New Jersey	527,408	11.9	.5	.1	1.6	9.2	.5
New Mexico	130,318	14.9	2.7	.1	.8	11.0	.3
New York	1,167,099	12.1	.8	.1	1.5	9.3	.3
North Carolina	848,279	19.1	2.3	.3	6.3	9.7	.6
North Dakota	97,140	23.2	9.5	1.6	2.1	10.0	—
Ohio	900,114	14.1	1.7	.2	1.1	10.6	.5
Oklahoma	310,319	17.2	5.1	.3	1.5	10.2	.2
Oregon	342,671	18.0	4.6	.3	1.6	11.2	.3
Pennsylvania	926,621	14.2	1.3	.2	2.3	10.0	.4
Rhode Island	71,169	13.2	.5	.1	1.8	10.4	.5
South Carolina	378,757	18.3	1.7	.2	5.0	10.8	.7
South Dakota	106,669	22.7	8.6	1.0	2.7	10.1	.3
Tennessee	553,057	17.4	3.2	.3	3.1	10.2	.5
Texas	1,602,979	15.0	2.8	.2	1.6	10.1	.3
Utah	159,012	13.3	1.7	.2	1.4	9.8	.3
Vermont	60,810	16.8	3.0	.2	1.7	11.6	.3
Virginia	561,827	14.4	1.9	.2	2.5	9.4	.4
Washington	523,318	16.4	3.4	.3	1.6	10.8	.4
West Virginia	121,284	14.8	2.9	.2	1.2	10.2	.2
Wisconsin	550,168	17.6	3.7	.6	2.4	10.1	.8
Wyoming	51,246	17.1	4.6	.4	.5	10.6	1.0

— = Less than 0.1 percent.

Source: Calculated by ERS using Department of Commerce data.

Appendix D: Two Methods of Measuring Farm-Linked Employment

Appendix table 5—Share of total nonmetro employment by farm and farm-related industry, 1996

State	Total farm and farm-related industries	Total farm and farm-related industries	Farm production, services, forestry, and fishing	Agricultural inputs	Agricultural processing and marketing	Agricultural wholesale and retail trade	Indirect agribusiness
	Jobs	Percentage of total employment					
United States	6,146,906	23.1	7.5	0.8	4.2	10.1	0.5
Alabama	178,567	28.3	5.9	.8	11.2	9.4	1.0
Alaska	39,343	21.0	7.2	.2	3.8	9.7	—
Arizona	44,814	16.7	2.3	.2	.3	13.9	.1
Arkansas	162,874	24.9	7.9	1.0	6.7	8.8	.6
California	100,182	21.7	8.1	.5	1.4	11.5	.2
Colorado	95,647	21.3	6.0	.5	1.8	12.9	.1
Connecticut	19,392	15.0	1.8	.1	2.2	10.1	.8
Delaware	18,014	27.8	3.9	.7	9.8	13.4	—
Florida	89,868	22.1	6.9	.6	1.7	12.4	.5
Georgia	280,333	24.5	4.5	.7	8.7	9.8	.8
Hawaii	39,121	22.5	5.7	.1	2.1	14.7	—
Idaho	105,815	24.6	8.7	1.4	3.3	10.8	.5
Illinois	204,119	22.0	7.7	1.6	2.4	9.7	.6
Indiana	164,905	19.3	5.8	.7	2.4	9.7	.8
Iowa	265,085	28.7	12.2	2.1	4.6	9.2	.6
Kansas	181,209	26.5	10.9	1.4	4.6	9.2	.4
Kentucky	225,477	24.9	9.8	.5	4.3	9.8	.5
Louisiana	89,024	21.2	7.5	1.0	3.2	8.8	.8
Maine	66,627	17.6	3.5	.1	2.9	10.6	.5
Maryland	39,103	20.2	4.3	.4	3.2	12.1	.2
Massachusetts	7,549	15.1	2.6	.1	1.1	10.8	.5
Michigan	142,954	18.8	5.1	.3	1.1	11.8	.5
Minnesota	214,225	26.2	10.4	1.5	4.1	9.7	.5
Mississippi	196,023	22.3	6.3	.7	5.7	9.0	.6
Missouri	224,699	25.3	11.0	.9	4.1	9.0	.3
Montana	75,465	20.3	7.6	.5	.7	11.3	.2
Nebraska	155,611	31.4	13.8	2.7	5.4	9.4	.1
Nevada	17,060	13.1	3.0	.4	.3	9.4	.1
New Hampshire	37,367	13.7	1.2	.1	1.1	10.9	.3
New Jersey	NA						
New Mexico	59,203	18.8	5.4	.3	.9	11.6	.6
New York	114,712	16.7	4.0	.3	1.5	10.6	.3
North Carolina	315,097	26.1	4.7	.5	10.6	9.7	.8
North Dakota	64,532	29.7	16.1	2.0	2.5	9.1	—
Ohio	201,865	19.4	5.2	.7	2.3	10.4	.9
Oklahoma	152,682	24.8	11.5	.7	2.8	9.7	.3
Oregon	118,327	23.8	8.8	.6	1.8	12.3	.4
Pennsylvania	154,557	18.7	3.7	.3	3.5	10.7	.5
Rhode Island	5,759	13.2	1.0	—	.3	11.9	—
South Carolina	123,367	24.4	3.4	.3	9.5	10.4	.8
South Dakota	76,490	26.5	12.8	1.4	2.8	9.5	.1
Tennessee	203,150	24.0	7.7	.5	5.9	9.2	.7
Texas	375,302	27.1	13.5	.8	3.3	9.2	.3
Utah	45,384	19.4	5.6	.4	2.0	11.1	.4
Vermont	41,453	17.3	3.5	.3	1.5	11.9	.2
Virginia	168,651	24.0	6.1	.5	7.4	9.3	.8
Washington	119,918	26.0	10.5	.9	2.3	11.4	.9
West Virginia	66,768	15.6	4.3	.2	1.5	9.5	.2
Wisconsin	219,209	24.5	8.7	1.3	3.2	10.4	.8
Wyoming	40,008	19.1	5.9	.4	.7	10.7	1.4

— = Less than 0.1 percent.

NA = Not applicable. New Jersey has no nonmetro counties.

Source: Calculated by ERS using Department of Commerce data.

Appendix table 6—The food and fiber system and the domestic economy, 1988-98

Item	1991	1992	1993	1994	1995	1996	1997	1998
Millions of jobs								
Total civilian labor force	126.3	128.1	129.2	131.1	132.3	133.9	136.3	137.7
Food and fiber system employment	23.5	23.1	23.6	24.3	24.7	24.5	24.6	24.8
Percent								
Food and fiber system share of labor force	18.6	18.0	18.3	18.6	18.7	18.3	18.1	18.0
Food and fiber system employment by sector:								
Millions of jobs								
Farm sector	2.0	1.9	1.8	1.9	2.0	2.0	1.9	1.8
Nonfarm sector	21.5	21.2	21.8	22.4	22.7	22.5	22.7	23.0
Food processing	1.6	1.5	1.5	1.5	1.5	1.4	1.4	1.4
Manufacturing	2.6	2.5	2.5	2.5	2.4	2.4	2.3	2.2
Transportation, trade and retailing	7.9	7.9	8.1	8.4	8.6	8.6	8.8	9.0
Eating and drinking places	6.1	6.0	6.3	6.5	6.6	6.6	6.7	6.8
All other	3.4	3.3	3.4	3.5	3.6	3.5	3.6	3.6
Billions of dollars								
Total Gross Domestic Product (GDP)	5,986.2	6,318.9	6,642.3	7,054.3	7,400.5	7,813.2	8,300.8	8,759.9
Total food and fiber system GDP	881.8	924.8	971.4	1,077.1	1,140.8	1,216.5	1,323.3	1,367.2
Percent								
Food and fiber system share of GDP	14.7	14.6	14.6	15.3	15.4	15.6	15.9	15.6
Food and fiber system GDP by sector:								
Billions of dollars								
Farm sector	71.1	75.5	73.1	78.3	75.3	86.7	84.5	74.3
Nonfarm sector	810.7	849.3	898.3	998.8	1,065.5	1,129.8	1,238.8	1,292.9
Food processing	110.9	112.9	120.0	134.4	145.8	144.1	158.8	166.9
Manufacturing	131.6	135.4	143.0	164.5	180.6	193.2	209.6	215.2
Transportation, trade and retailing	261.0	278.0	294.7	328.7	347.8	376.9	419.1	441.4
Eating and drinking places	110.4	117.6	127.3	141.4	148.7	161.0	181.0	188.1
All other	196.7	205.5	213.3	229.9	242.6	254.5	270.3	281.3

Note: These improved estimates of Food and Fiber employment and GDP differ slightly from data tables published in previous issues of *RCaT*, due to extensive revisions to the National Income and Product Accounts data used in the ERS calculations.

Source: Calculated by ERS from supporting ERS economic models using data from the Bureau of Economic Analysis, Bureau of Labor Statistics, and Bureau of the Census.